

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/075,754	PETROVICH ET AL.	
	Examiner	Art Unit	
	Anjan K. Deb	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to amendment filed 04/18/2005.
2.  The allowed claim(s) is/are 1-14 and 16-32.
3.  The drawings filed on 19 August 2002 are accepted by the Examiner.
4.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All      b)  Some\*      c)  None      of the:
    1.  Certified copies of the priority documents have been received.
    2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6.  CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.
  - (b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of
 Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

#### Attachment(s)

1.  Notice of References Cited (PTO-892)
2.  Notice of Draftperson's Patent Drawing Review (PTO-948)
3.  Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date 04/22/2005
4.  Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5.  Notice of Informal Patent Application (PTO-152)
6.  Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7.  Examiner's Amendment/Comment
8.  Examiner's Statement of Reasons for Allowance
9.  Other \_\_\_\_\_.

## **DETAILED ACTION**

1. This office action is in response to amendment filed 04/18/2005.

### ***Allowable Subject Matter***

2. Claims 1-14, 16-32 are allowed.

### ***Reasons for Allowance***

3. The following is an examiner's statement of reasons for allowance:

The primary reason for allowance of the claims is the inclusion of a flexure plate wave sensor and a drive circuit responsive to a phase detector circuit and configured to maintain a fixed phase difference between the input and output signal, and a processing circuit responsive to the output signal and configured to detect resonant frequency changes of the sensor due to mass changes to measure mass loading. This limitation is recited in all of the independent claims is neither disclosed nor suggested in the prior art in the combination as claimed.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Baer (US 5,283,037 A) discloses chemical sensor comprising flexural plate wave resonant device for detecting the concentration of the antibodies in a liquid by immersing the

sensor in the liquid and inferring the change in mass from the change in resonant frequency of the sensor. Baer also discloses in an alternative embodiment, measuring the phase of sensor output signal for detecting the concentration.

Chung et al. (US 6,336,368 B1) discloses flexural plate wave resonant device for detecting a chemical by absorbing the chemical in a polymer layer thereby increasing the polymer's mass, which changes the resonant frequency of the resonant device. By detecting frequency shift, one can infer the presence of, and concentration of, the chemical, and infer total exposure to the chemical. Chung et al. also disclose measuring phase difference of a signal between loaded and unloaded device to uniquely determines the change in resonance characteristics of device.

Adkins et al. (US 6,820,469 B1) discloses flexural plate wave resonant device when used as a chemical sensor, the collection of analyte mass on the surface of the resonator is reflected as a change in the resonant frequency. Adkins et al. disclose in an alternative approach to determining the resonant frequency is to track the phase difference between the drive voltage and drive current then minor changes in mass will cause a shift in the phase difference between the drive voltage and the drive current.

None of the cited references teach a drive circuit responsive to a phase detector circuit, and configured to maintain a fixed phase difference between the input and output signal, and a processing circuit configured to detect resonant frequency changes of the sensor due to mass changes to measure mass loading.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

*Contact Information*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lefkowitz Edwards can be reached at 571-272-2180.



Anjan K. Deb

Patent Examiner

Art Unit: 2858

6/16/05

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